

WHAT IS CLAIMED IS:

*Sub*  
comprising:

An improved encoder for a CATV upstream data channel transmitter,  
5 a convolutional encoder for receiving data values,  
a bit-interleaver interconnected with said encoder, and  
a symbol mapper interconnected with said bit-interleaver.

10 2. The encoder of claim 1, wherein said *simple* mapper is a QPSK or QAM  
mapper.

15 3. A bit interleaved decoder for a CATV upstream channel receiver, comprising:  
a scorer for receiving symbols,  
a bit de-interleaver interconnected with said scorer, and  
a convolutional decoder interconnected with said bit de-interleaver.

20 4. A method for communicating over a noisy channel, comprising:  
encoding a data stream with a convolutional encoder to provide an encoded data  
stream,  
interleaving said encoded data stream, and,  
retrieving interleaved encoded data and mapping said data into symbols.